in U.S. Patent No. 5,324,639, the amount of "PTM1" trace salts added during fermentation can be beneficially reduced approximately 10-fold, to a single addition of 2 ml per liter starting medium. Preferably, the levels of sulfuric
5   acid, copper, zinc and iron in the "PTM1" is reduced 3-fold in comparison to the process described in the 5,324,639 patent.

When the invention is practiced with recombinant secreted IGF-I, the host cells must be removed from the IGF-
10   I-containing medium. Cell removal may be by any suitable means, e.g., centrifugation or microfiltration, or both.

First Cation Exchange Step

Following host cell removal, the first step in the process of this invention is contacting an IGF-I-containing
15   sample solution with a suitable quantity of a first cation exchange matrix under conditions allowing adsorption of at least about 95% of the total IGF-I from the solution.

The IGF-I-containing solution may be contacted with the first cation exchange matrix in various ways. For
20   example, the first cation exchange matrix may be in a vessel into which the IGF-I-containing medium is introduced, followed by decanting of the IGF-I-depleted medium from the first cation exchange matrix. Alternatively, the first cation exchange matrix can be added to the vessel containing
25   the IFG-I-containing medium, followed by removal of IGF-I-depleted solution from first cation exchange matrix. Preferably, the first cation exchange matrix is in a column through which the IGF-I-containing medium is allowed to flow.
30   Matrices that may be used in the first cation exchange step are well known in the art. Preferably, the cation exchange matrix is compatible with a high flow rate,

- 9 -

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